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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/754,710

01/12/2004

Jung-Chou Huang

BHT-3183-64

1370

7590

04/26/2006

BRUCE H. TROXELL

SUITE 1404

5205 LEESBURG PIKE

FALLS CHURCH, VA 22041

EXAMINER

NGUYEN, HOA CAO

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 04/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H/A

Office Action Summary

Application No.

10/754,710

Applicant(s)

HUANG ET AL.

Examiner

Hoa C. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS; WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The amendment filed on 2/22/06 has been entered. Applicants have cancelled claims 1-15 and added new claims 16-18. Claims 16-18 are considered in this Office Action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibuya et al. (US 4411982) in view of Nakashima et al. (US 5661086) and Leppard et al. (US 6361925).

Regarding claims 16-17, Shibuya et al. discloses a tape type flexible printed circuit comprising:

(a) A flexible insulated layer 1 (flexible substrate) having a thickness about 50 μm (figure 3, column 3, lines 8-12);

(b) a plurality of copper traces 1b/33 (copper foil and plated layer for forming circuit patterns, see abstract and column 4, lines 10-12 and 26-28) formed on the flexible insulated layer and having a thickness about 35 μm (figure 4 and column 3, lines 8-12);

(c) as clearly shown in figure 16, a cover layer 45 (solder resist film, column 4, lines 13-18) formed directly on a top of the flexible insulated layer and the plurality of

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copper traces, the cover layer having hollow portions 20/20' and hollow portions on predetermined parts of the substrate (column 3, lines 20-25 and column 4, lines 15-18);

(d) connection terminals 33 (same reference number, column 4, lines 15-18) of the metal traces 33 of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer; and

(e) a plurality of sprocket holes 19 (positioning-perforations, figure 3, column 3, lines 24) located at two opposing sides of the tape type thereof.

However, Shibuya et al. does not disclose the tape type flexible printed circuits arranged in a plurality of rows, the thickness or the material of the cover layer, and a plurality of parallel cutting lines located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits.

Nakashima et al., at least as shown in figures 1-4 and 7-8, disclose a flexible circuit board comprising a flexible insulated layer 17 (a circuit substrate, column 6, lines 43-54), a plurality of copper traces 21 (conductive leads, column 6, lines 55-67), a cover layer 23 (solder resist layer, column 7, lines 5-20) having hollow portions 24a (spaces, figure 4, column 9, line 56-65) for exposing connection terminals 19/20 (bonding pads, terminal pads), a plurality of sprocket holes 30 (positioning pilot apertures, column 8, lines 14-38), and a plurality of cutting lines 34 (split lines, column 8, lines 56-67) and lines between side rails 43 (considering the line between the rails 43 as a cutting line for separating rows of semiconductor dies).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to apply the teaching(s) from Nakashima et al. to have the tape

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type flexible printed circuits arranged in a plurality of rows for a mass production purposes, and a plurality of parallel cutting lines located between the plurality of sprocket holes of the adjacent tape type flexible printed circuits for separating rows of semiconductor dies. It is further noticed that in mass quantity manufacturing, semiconductor dies are conventionally arranged in rows and the rows must be split. Therefore, there must be splitting lines between rows.

Leppard et al. teach a polyester resin for uses as protective layers where solder mask or solder resist is one of the applications, see column 21, lines 19-63, column 13, lines 3-4 (polyester resin), column 19, line 64 continuing column 20 lines 18 (solder masks for electronic circuit). Leppard et al. further disclose that the cover layer thickness and the nature of the layer support (base) are dependent on the desired field of application, see column 21, lines 49-52. It is also noticed that polyester, polyimide, photoimagable solder mask are well known in the art for uses in solder masking, resisting, coating, and encapsulating, and the thickness of the coating is dependent to a specific application and commonly in the range of 12-30 μm for coating printed circuits.

It would be obvious to one having ordinary skill in the art at the time of the invention was made to apply the commercially well known polyester as taught by Leppard et al. as a cover layer on the flexible printed circuits of Shibuya et al. for protecting the printed circuits formed on the tape type flexible printed circuit and with a thickness in a conventionally well known range of 12-30 μm .

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Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 18, Shibuya et al. disclose an electroplating layer 33 located on of each of the connection terminals of each of the plurality of copper traces, see column 3, lines 29-35.

Response to Arguments

4. Applicant's arguments filed on 2/22/06 have been fully considered but they are not persuasive. Applicant argues:

(a) Page 5, 3rd paragraph: Shibuya et al. do not teach a tape type flexible printed circuits having a cover layer formed directly on a top of the flexible insulated layer and the plurality of copper traces; the cover layer having a plurality of hollow portions; connection terminals of each of the plurality of copper traces aligning with and being exposed through one of the plurality of hollow portions of the cover layer.

As shown in claim 16 above, Shibuya et al. do teach the above underlined elements.

(b) Page 6, 2nd paragraph: The teachings from Lepparde et al. do not have the structure elements as disclosed by the applicants.

Lepparde et al. do not have to teach about the structure disclosed by the applicants. Lepparde et al. do teach a chemical compound for coating an electronic circuit such as polyester. The coating compound is conventionally known and widely

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used for coating purposes. The examiner discloses Lepparde et al. as a proof of a conventionally known coating compound.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

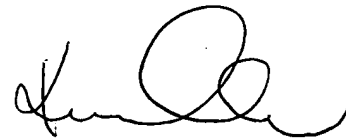
Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa C. Nguyen whose telephone number is 571-272-8293. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'K. Cuneo'.

K Cuneo
SPE 2841